Innovative Service Concept Generation Based on Integrated Framework of Design Thinking and VRIO: The Case of Information Supporting System for SMEs in Korea

Bong-Goon Seo  
Graduate School of Business IT, Kookmin University, Seoul, Korea  
bgseo@kookmin.ac.kr

Do-Hyung Park  
Department of Management Information Systems, Kookmin University, Seoul, Korea  
dohyungpark@kookmin.ac.kr

Daeheon Choi  
College of Business Administration, Kookmin University, Seoul, Korea  
dhchoi@kookmin.ac.kr

ABSTRACT
Recently, as Information resources being distributed in large quantities, small and medium-sized enterprises perspective, the ability to integrate and utilize the data itself became insufficient. Therefore, in order to compensate for this problem, in the consumer side, it is necessary to integrate the information that has been personalized. In the provider side, it is necessary to convert the information that has been popularized into custom information. The aim of this study is to derive strategic support services by investigating small and medium-sized enterprise’s information needs and information resources analysis. To do so, this study attempted to develop a concept based on the design thinking methodology that is deemed to innovation concepts. Furthermore, we are trying to integrate the VRIO framework to design thinking methodology. We expect several key insights based on the integrated approach and will derive innovative concepts. This study will be the first attempt to develop a service concept that is based on consumer insight in the public institutions. In addition, these services enable SMEs to take advantage of the information and to improve their information capacity.

CCS Concepts
• Human-centered computing → Human computer interaction (HCI) → HCI design and evaluation methods

Keywords
Design Thinking; Innovative Service; Resource-based View; VRIO Framework; SME

1. INTRODUCTION
While a social paradigm has changed from focusing on an industrial society to an information society, information literacy and the capacity of enterprises have been directly linked to corporate performance management. In a traditional industrial society, land, labor, and capital were the main factors of production. In the modern information society, in contrast, knowledge and information are becoming the main factors. Furthermore, in the past, a key industry equals with a major industrial manufacturing center, which included steel-working, and shipbuilding. However, in modern times, networks, software, and contents, such as the information communication device industry, have emerged as the key industries. In the past, the standardized training of the supply center and a focus on the particular technology and qualification for mass production were considered basic knowledge. Now, these have been supplanted by the ability to produce, process, and distribute information. Accordingly, modern technology and the business environment are changing at a very fast speed. Due to IT development, information resources were produced in large quantities, and they have been accumulated and widely distributed. In addition, this is a situation that has rapidly changed the social paradigm. For example, it caused a huge difference in the literacy of the same information in order to create value innovation. Currently, with information resources being distributed in large quantities, there is a range of information that is extremely diversely distributed. However, this has resulted in a situation in which small and medium-sized enterprises lack the ability to integrate the data on their own. For example, the information is sorely needed at all stages of corporate commercialization opportunities, such as opportunity evaluation, project selection, environmental analysis, concept embodiments, and strategies. Consequently, the efficiency will drop with too much or too widely distributed information. Therefore, the consumer’s primary role is to integrate the information that has been personalized in order to compensate for such problems. The provider’s primary role, on the other hand, is to convert the information that has been popularized into custom information.

The aim of this study is to derive strategic support services by investigating small and medium-sized enterprise’s information needs and information resources analysis. Through this
investigation, this study attempts to possibly maximize a company's contribution to creating economic effect. To do so, we will build a personalized service platform for small and medium-sized enterprises. We will also attempt to study our research and analysis model in order to identify the needs and potential needs of small and medium-sized enterprises in terms of information resources. Furthermore, we are trying to develop a concept and evaluation process based on the design thinking methodology that is deemed suitable to lead innovation concepts, and we want to find the hidden needs of small and medium-sized companies. Finally, we aim to develop an innovation service concept based on SME’s needs.

In this study, through a literature review and an interview with an expert in existing information resources and users, we derived insight based on the user's needs. Thereafter, we derived an opportunity area based on insight, and then developed and evaluated the concept. In the final stages of concepts, we conducted a study to derive a final concept based on the current user's needs, insight, ideas, internal resources, and results analysis.

2. THEORETICAL BACKGROUND

2.1 Definition of Design Thinking Methodology

Design thinking methodology includes in its meaning both scientific and aesthetic approaches (Archer, 1979). Design thinking is defined as “approaching management problems as designers’ approach design problems” (Dunne & Martin, 2006), and “the balanced thinking appearing to fuse analytical thinking and intuitive thinking” (Martin, 2009). In other words, it is a methodology that properly fuses the process of concrete problem solving and abstract thinking.

The concept of design thinking methodology accounts for three different knowledge domains at the same time: business, technology, and design. For each role, the design entails for needs/wants/desires by customers; the business involves reliability and profitability in a market; and technology concerns feasibility and cost-effectiveness of the products, systems, and services. There are couples of the other design approaches and methodologies in each region such as ‘engineering design’ in UK, ‘participatory design’ in Scandinavian, and ‘user-centered design’ in the United States.

Design thinking starts from the specific facts collected through a specific set of observation activities. It can collect information in various ways and furnish a variety of insights based on the collected information. Thereafter, by defining a pattern between the insights, we will go beyond abstract thinking. In the next step, we can identify the specific problem solution ideas (opportunity) and thereby derive a realistic concept that takes the available resources and feasibility into account.

The characteristics of design thinking are (1) it is an approach that imagines and creates new solutions as a kind of mindset, (2) it begins with understanding people’s motivations and desires, (3) it is based on optimism, (4) it is important to cooperative teamwork as a method of communication and criticism, (5) and it fosters learning through “experimentation” and by performing the feedback process repeatedly (Brown, 2008). With these features, it is possible to extract the important facts and insights into the target customer and to catch persuasive opportunity areas.

While the existing research method is a top-down approach to deriving new ideas, design thinking methodology is bottom-up approach that derives output from user’s latent needs. Recently, design thinking methodology has been used in various fields to resolve problems and adapt to changes. It is being used in business strategy (Sato, 2009; Uehira & Kay, 2009; Holloway, 2009), education (IDEO & Riverdale Country School, 2011; Dunne & Martin, 2006) and social innovation (Brown & Wyatt, 2010) to solve problems by deriving creative and innovative ideas.

2.2 VRIO Framework

Barney (1991) proposed the “VRIN framework” as an analytic tool that can find a strategic resource. The framework was modified to reflect the importance of organization (Barney, 1995; 1997; Barney & Clark, 2007). This theory is based on a resource-based view. The core content of the resource-based perspective study is to highlight the importance of resources and to identify what resources can create a sustainable competitive advantage. As such, the resource-based view takes as a key research topic the identification of the kinds of resources that can create a competitive advantage for businesses. The concept of resources has been developed from the concept of individual resources, which includes human resources and physical resources (Barney, 1991), intangible assets (Itami, 1987), and the concept of enterprise units’ core competencies (Hamel & Prahalad, 1990) and their abilities to, for instance, bind resources (Grant, 1996).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>Competitive Disadvantage</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
<td>Competitive Equality</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>Short-term Competitive Advantage</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Unused Competitive Advantage</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Long-term Competitive advantage</td>
</tr>
</tbody>
</table>

Figure 1. VRIO Framework

The VRIO (Barney & Clark, 2007) analytical framework for explaining the company’s core resources is a model that analyzes the inner workings of a company based on its resources-based perspective. In addition, it is assumed that the company has a competitive advantage in order to create economic value compared to other companies. VRIO presents the properties of the four resources that have the most decisive influence to connect in a competitive advantage - Value, Rareness, Inimitability, and Organization.

Value - Resources that can help enterprises to recognize and execute a strategy that improves their efficiency and effectiveness and enables the neutralization of
Meaningful insight into the enterprise can be derived through the analysis of these four management resource characteristics.

Overall, the VRIO model can be usefully applied to analyze the strategic thinking and decision making of enterprises, as well as various combinations of enterprise resources. From this perspective, this study will analyze the voices of companies based on the VRIO of the company’s core competency framework. Then, we will try to derive meaningful insight using the results of the analysis and to use this as the inspiration for the concept-development services.

### 2.3 Developing Design Thinking Methodology Based on VRIO Framework

This study was conducted as a case study based on the design thinking methodology under the framework of VRIO. Design thinking methodology is used to determine customers’ needs as a creative problem-solving method, and the VRIO framework can take advantage of the existing resources within the enterprise as a resource-based view. It is important to find a common value between the provider and customer. This study tries to combine design thinking processes with the VRIO framework to analyze these both sides. That is, we need to know “what service providers want” (needs-based approach) and “what service customers want” (seeds-based approach) in order to apply all the needs of both sides. Since the design thinking methodology is effective to explore consumer needs and the VRIO framework is useful for a company (or a service provider), the integration of two approaches may be valuable, especially for new platform services. Another reason for the integration is that VRIO framework is able to complement the shortage of design thinking methodology. The design thinking methodology can derive a number of insights qualitatively. Thus, in-depth insights are identified with qualitative research, but it is not sure whether the derived insight to cover whole problems. In this case, the VRIO framework is a lot helpful to check missing parts or less-uncovered parts required additional resources.

#### Figure 2. Common Value from Service Providers and Consumers within a Business Platform

Here is a concrete plan of each step of the design thinking methodology.

#### Figure 3. Design Thinking Process

**Step 1: Define Objectives**

Starting from the question “How will you approach the issue?” it is important to understand the purpose of the issue, to organize your team, and to define roles. Team setting is a critical step in the design thinking methodology because the team has to create a stronger performance than they would deliver individually.

**Step 2: Immerse Data**

This entails the selection of subjects that have distinct characteristics in order to get the inspiration needed to create a new perspective. The main objective of this stage is to perform a variety of research activities through information gathering methods, and to get inspired with ideas for creating new possibilities. In addition, it is necessary to check the general user’s needs to take advantage of existing research.

**Step 3: Uncover Insight & Opportunity**

This step begins by changing the collected information into meaningful insights. VRIO is a useful framework to systematically ensure that the insights are derived without exception. In addition, the insights organized under VRIO will be able to provide the direction for creating core competencies. The following step is to derive opportunities by finding patterns between insights, and then to group them into a common theme. This step can obtain a clear direction for the idea by finding interesting
aspects through the grouping of information.

Step 4: Build Ideas

This step is the process of creating as many ideas as possible through insights. It is important to spread the various thoughts freely without realistic constraints. At this stage, it is important to consider how these ideas can be made into realities. In addition, one should check the additional requirements, give shape to a variety of resources and capabilities, and create budgets for finances and time to make ideas into realities.

Step 5: Develop Concept

A step that continuously complements the idea to develop the concept. If the prototype is possible, it may receive realistic feedback about the goods and services. In this step, the prototype is not necessarily specifically implemented and the idea derivation can be carried out additionally. Design thinking is a cyclical structure rather than a one-way process, because it is allowed to repeat the same process until you have enough to relieve the needs of potential customers.

![Design Thinking Process and VRIO Framework](image)

**Figure 4. Integration of Design Thinking Process and VRIO Framework**

3. Case Study

A public institution provides various services for small enterprises. However, each of these services has been implemented independently. There is also a limit to satisfy small/medium enterprises’ potential needs that are based on holistic experience. Furthermore, the provided system and services are focused on provider’s needs and partly reflected customer’s needs, rather than being solely focused on customer’s needs.

Accordingly, in order to develop a customized service that is based on the customer's needs, we try to apply the integrated approach combining design thinking methodology and VRIO framework to develop a customized information service.

4. Expected Conclusion

This study will be performed to integrate the VRIO framework and design thinking methodology. We will identify several key insights through interviews and literature research. Finally, we will derive the two concepts explained above.

The theoretical implications of this paper will have three folds. The first point will be to develop a service concept based on the design thinking methodology to focus on customer insight and creative problem solving. While traditional methodology is concentrated on the consumer side (needs-based), this study will focus not only on the consumer but also on the provider (two-side), by matching the existing information resources (seeds-based). This can be seen as a theoretical contribution to the larger body of research, since it studies the service support strategy. In addition, our study will classify insights based on the four perspectives of VRIO, which is used as the inspiration for the concept development services. Therefore, our study will be unique as it combines the design thinking methodology and the resource-based perspective - VRIO. Finally, our research is expected to contribute to the theory in terms of the design thinking approach, because it integrates the information services of public institutions.

This study will have two practical implications. First, it will be the first attempt to develop a service concept that is based on consumer insight in the public institutions, it will provide enterprise information infrastructure, and it can be seen as a representative case. Second, we will develop a strategy and roadmap for implementing a service to create an infrastructure environment. These services may enable SMEs to take advantage of the information and to improve their information capacity.

5. REFERENCES


